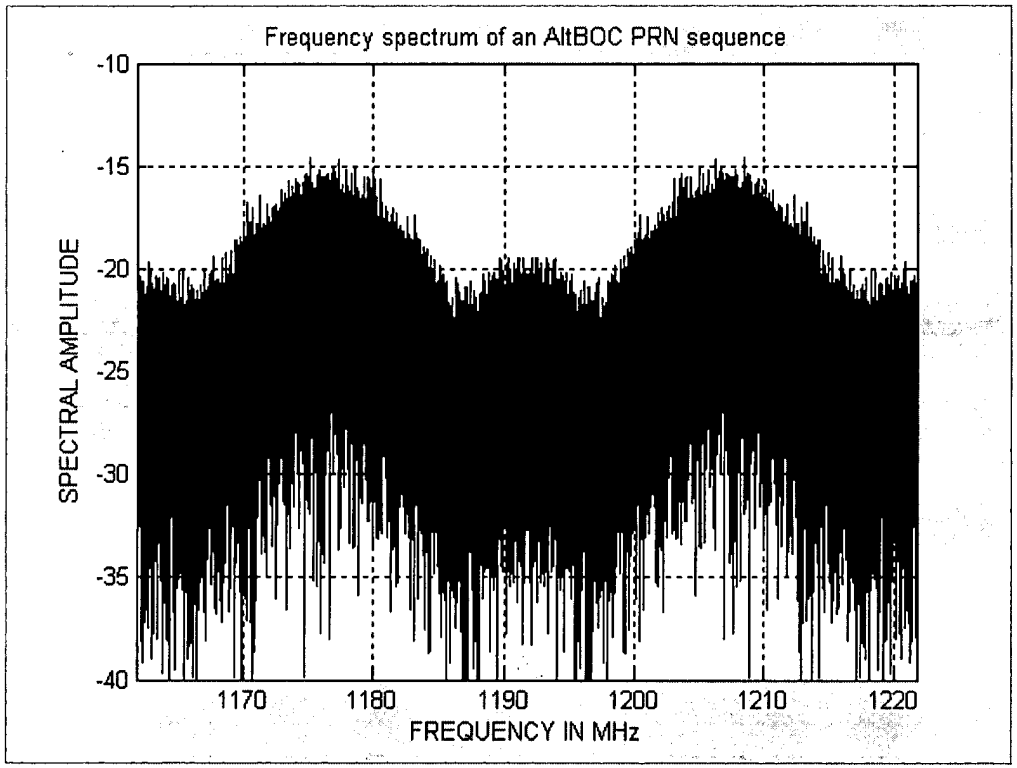
Frequency spectrum of an AltBOC PRN sequence
SPECTRAL AMPLITUDE
-10
-15
-20
-25
-30
-35
-40
1170
1180
1190
1200
1210
1220
FREQUENCY IN MHz

FIG. 1

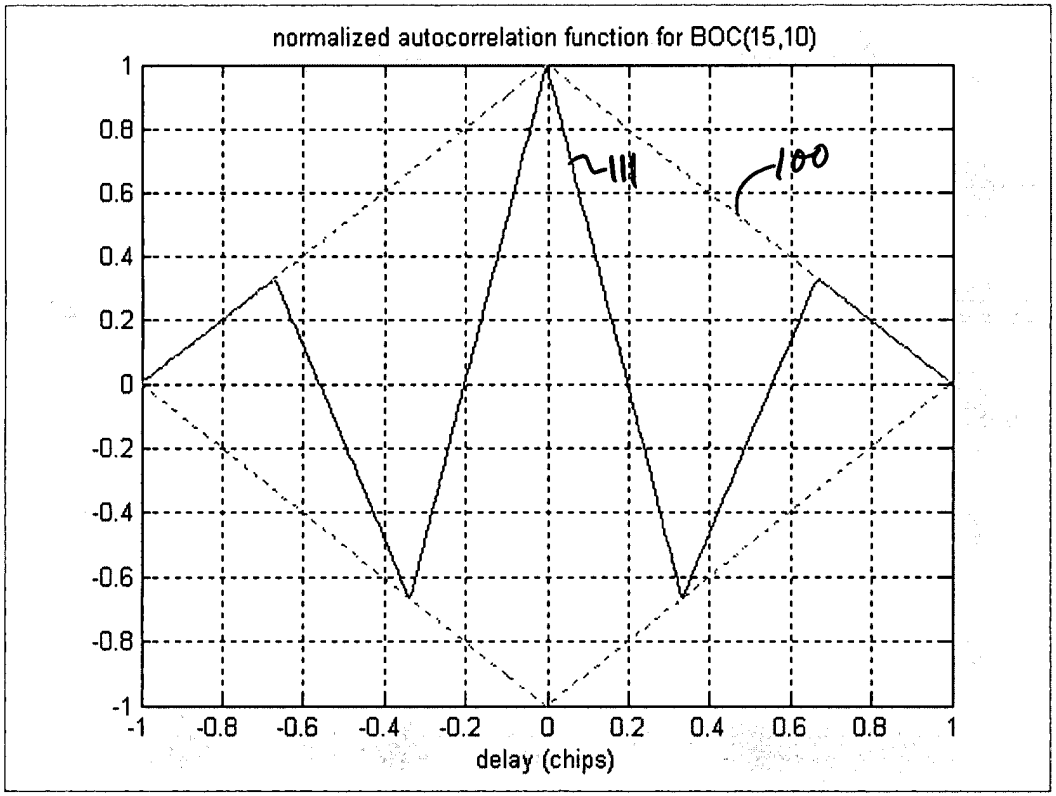
normalized autocorrelation function for BOC(15,10)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
delay (chips)
111
100

FIG. 2

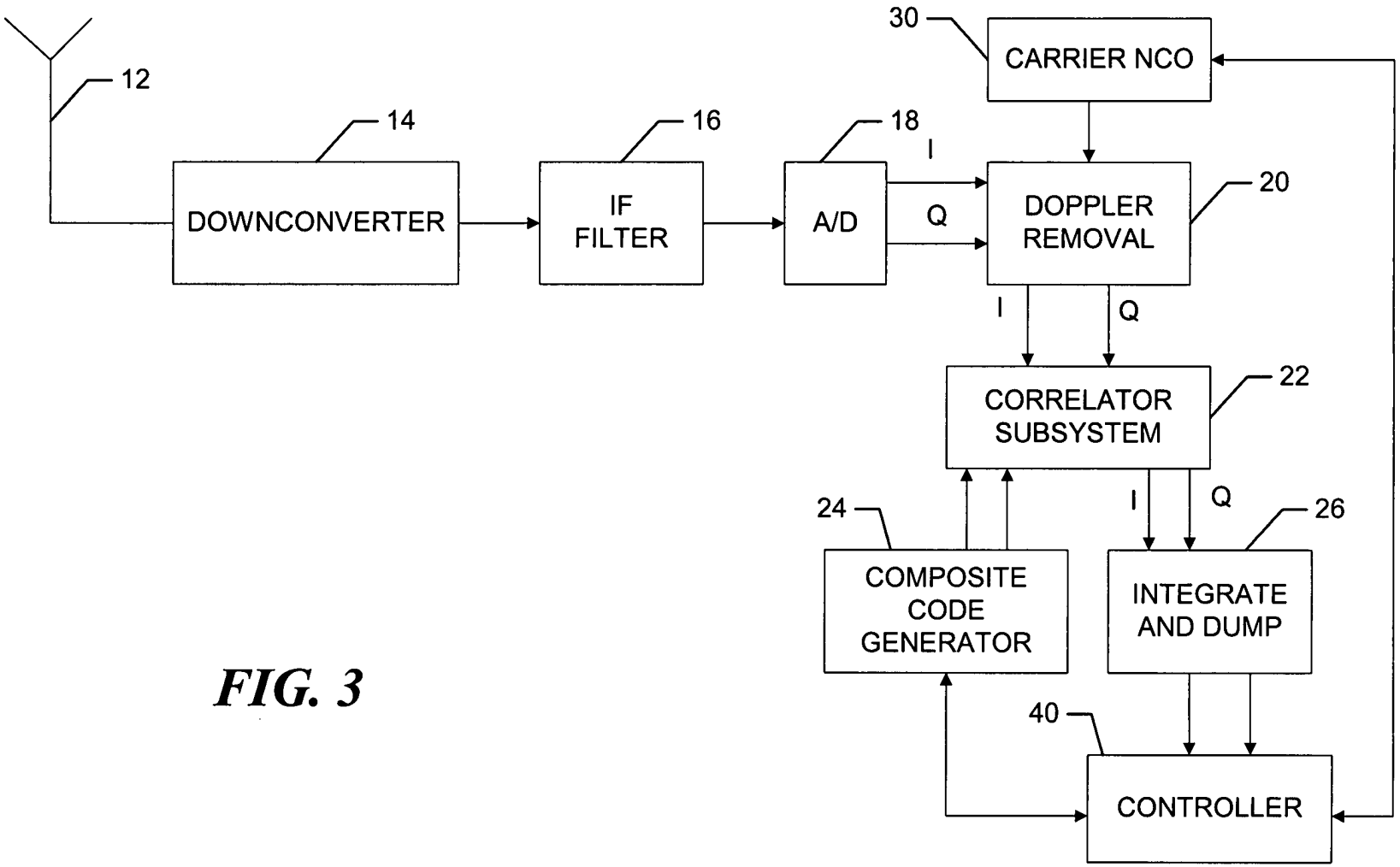
12
14
DOWNCONVERTER
16
IF
FILTER
18
A/D
I
Q
30
CARRIER NCO
20
DOPPLER
REMOVAL
I
Q
22
CORRELATOR
SUBSYSTEM
I
Q
24
COMPOSITE
CODE
GENERATOR
26
INTEGRATE
AND DUMP
40
CONTROLLER

FIG. 3

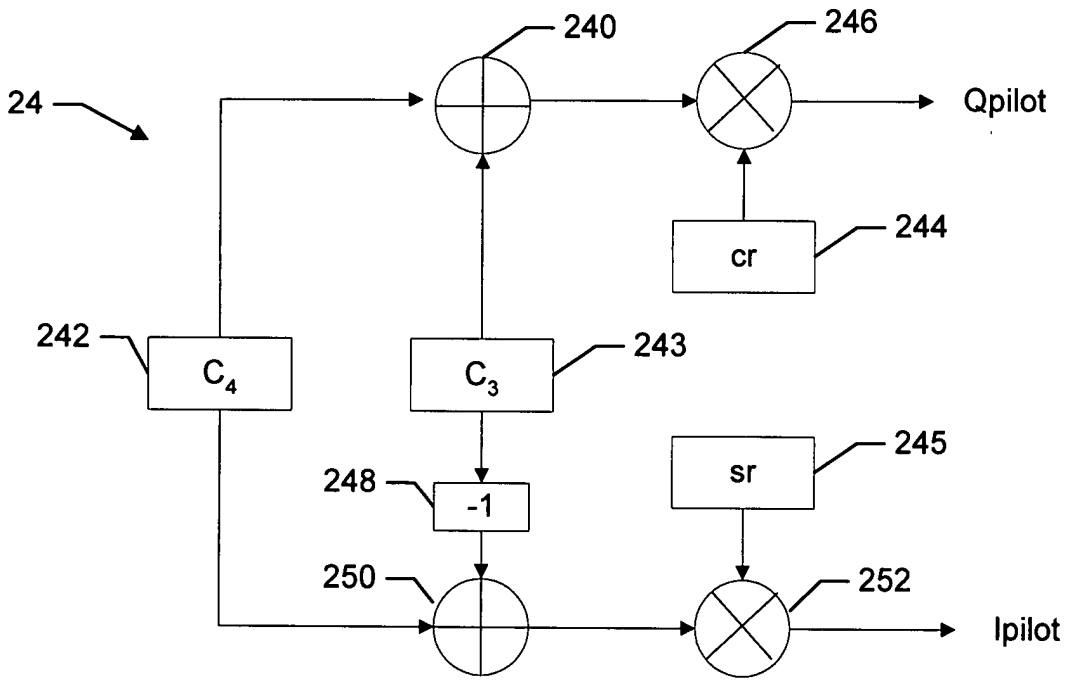
24
240
246
Qpilot
cr
244
242
C_4
C_3
243
248
-1
sr
245
250
252
Ipilot

FIG. 4

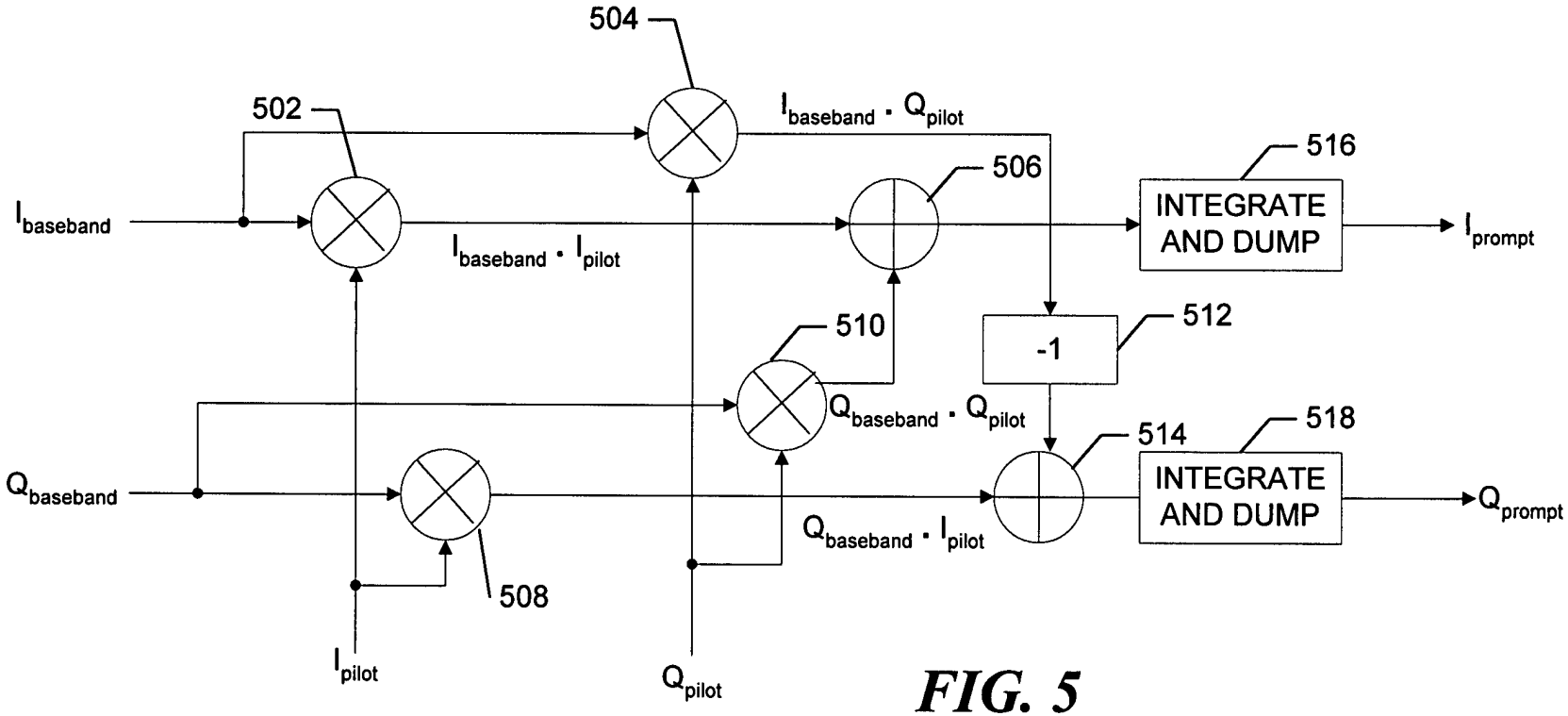
504
502
$I_{baseband} \cdot Q_{pilot}$
516
506
$I_{baseband}$
INTEGRATE AND DUMP
I_{prompt}
$I_{baseband} \cdot I_{pilot}$
510
512
-1
$Q_{baseband} \cdot Q_{pilot}$
514
518
$Q_{baseband}$
INTEGRATE AND DUMP
Q_{prompt}
$Q_{baseband} \cdot I_{pilot}$
508
I_{pilot}
Q_{pilot}

FIG. 5

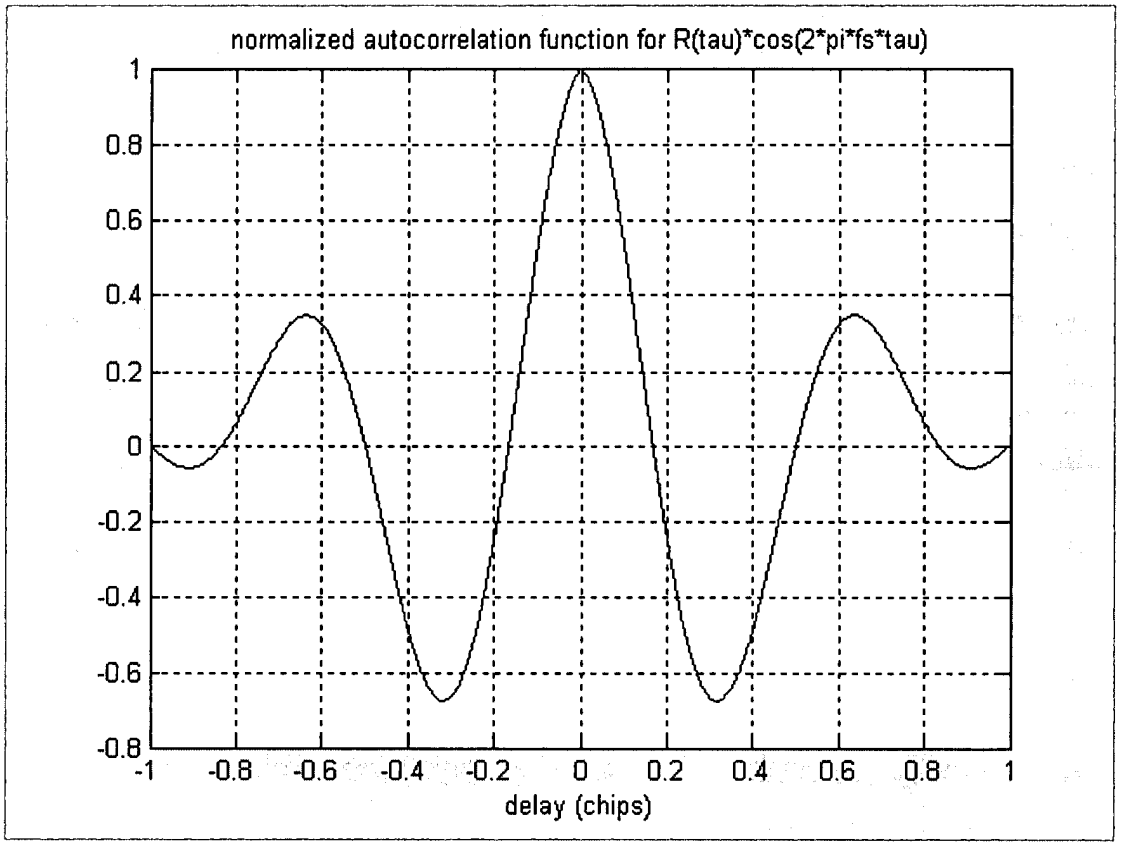
normalized autocorrelation function for R(tau)*cos(2*pi*fs*tau)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
delay (chips)

FIG. 6

R_1	-1	1	-1	1
R_2	-1	-1	1	1
R_1+R_2	-2	0	0	2
R_2-R_1	0	-2	2	0

FIG. 7

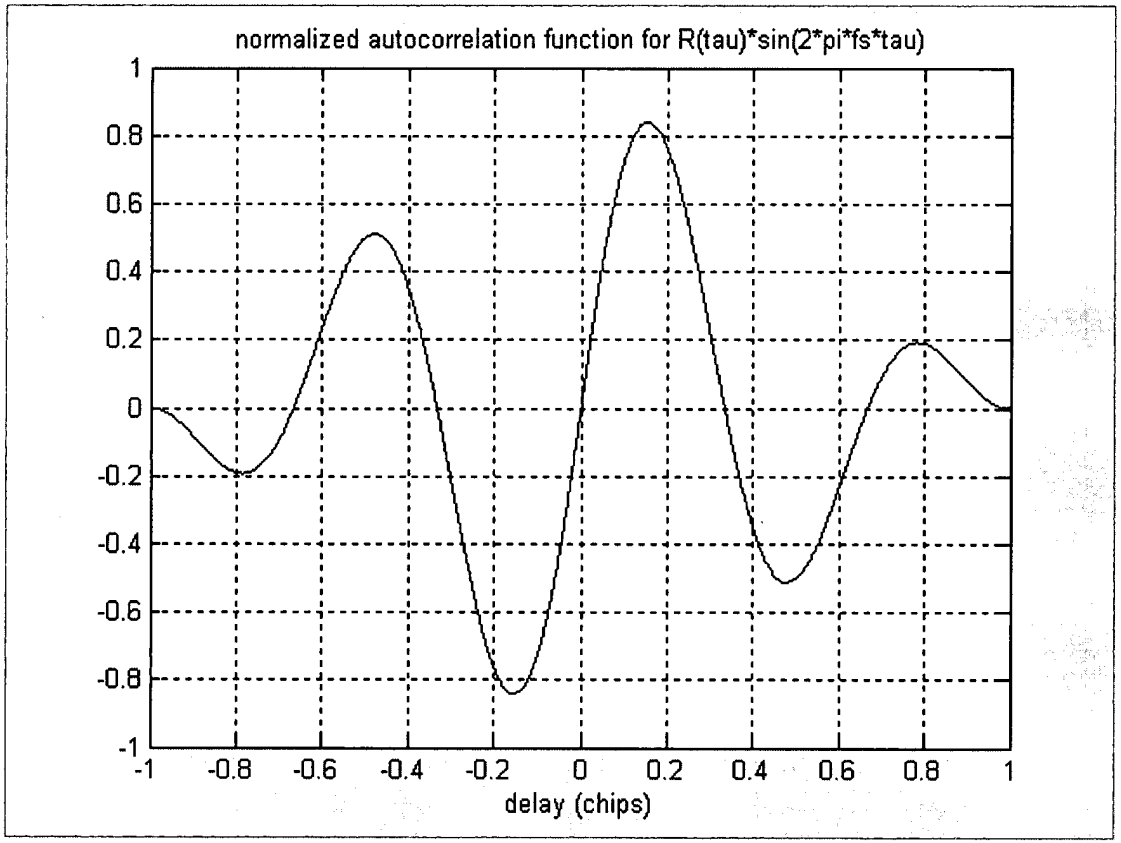
normalized autocorrelation function for R(tau)*sin(2*pi*fs*tau)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
delay (chips)

FIG. 8

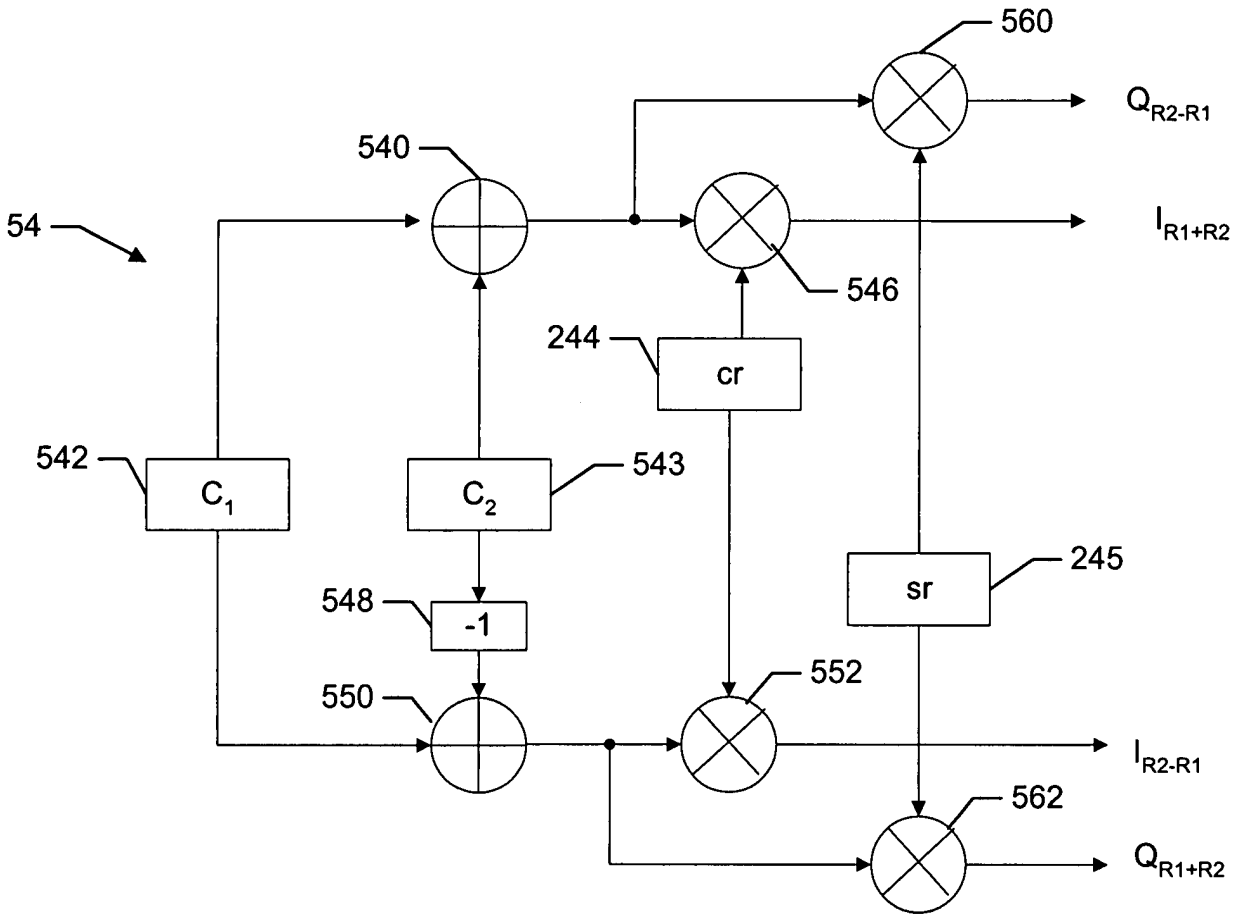
560
Q_{R2-R1}
540
54
I_{R1+R2}
546
244
cr
542
C_1
C_2
543
245
sr
548
-1
552
550
I_{R2-R1}
562
Q_{R1+R2}

FIG. 9

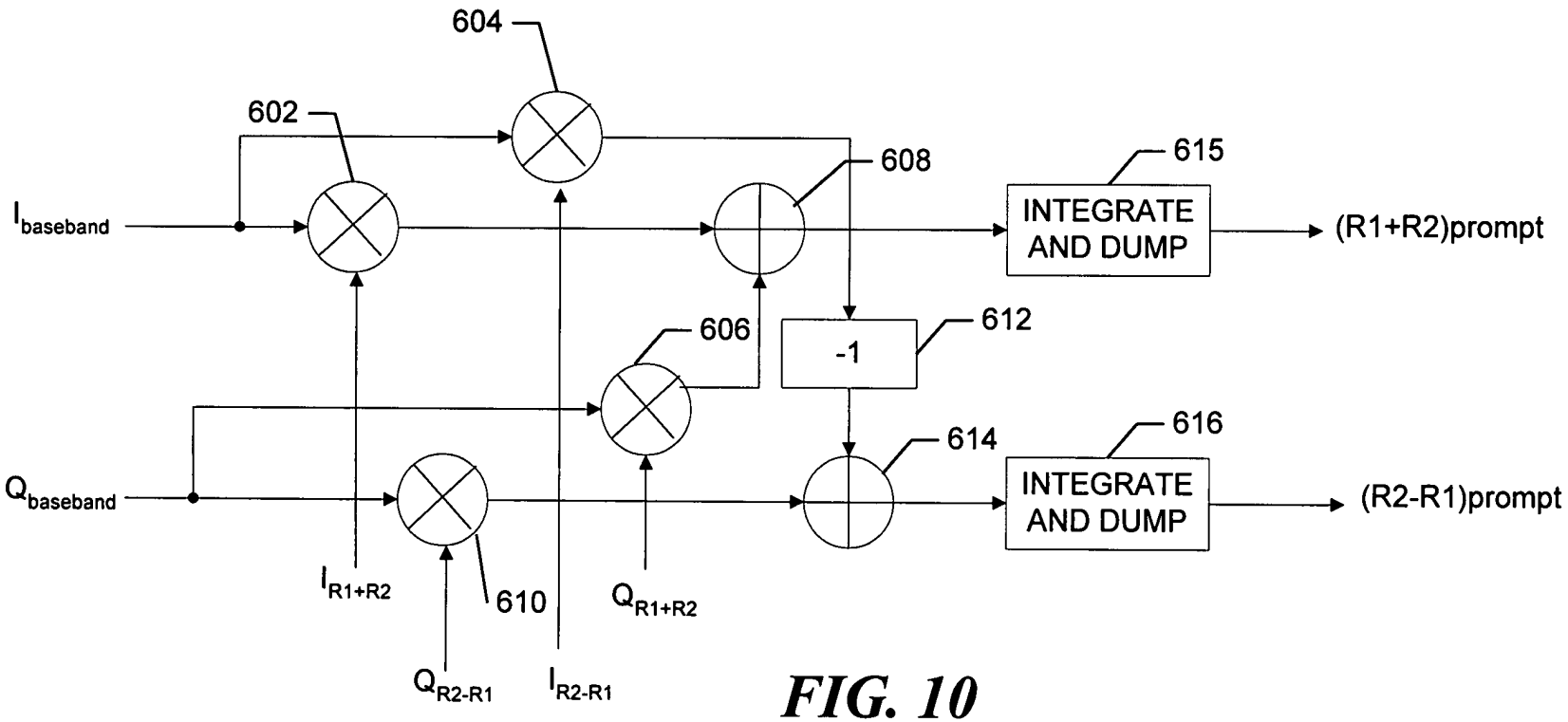
604
602
608
615
$I_{baseband}$
INTEGRATE AND DUMP
(R1+R2)prompt
606
612
-1
614
616
$Q_{baseband}$
INTEGRATE AND DUMP
(R2-R1)prompt
I_{R1+R2}
610
Q_{R1+R2}
Q_{R2-R1}
I_{R2-R1}

FIG. 10

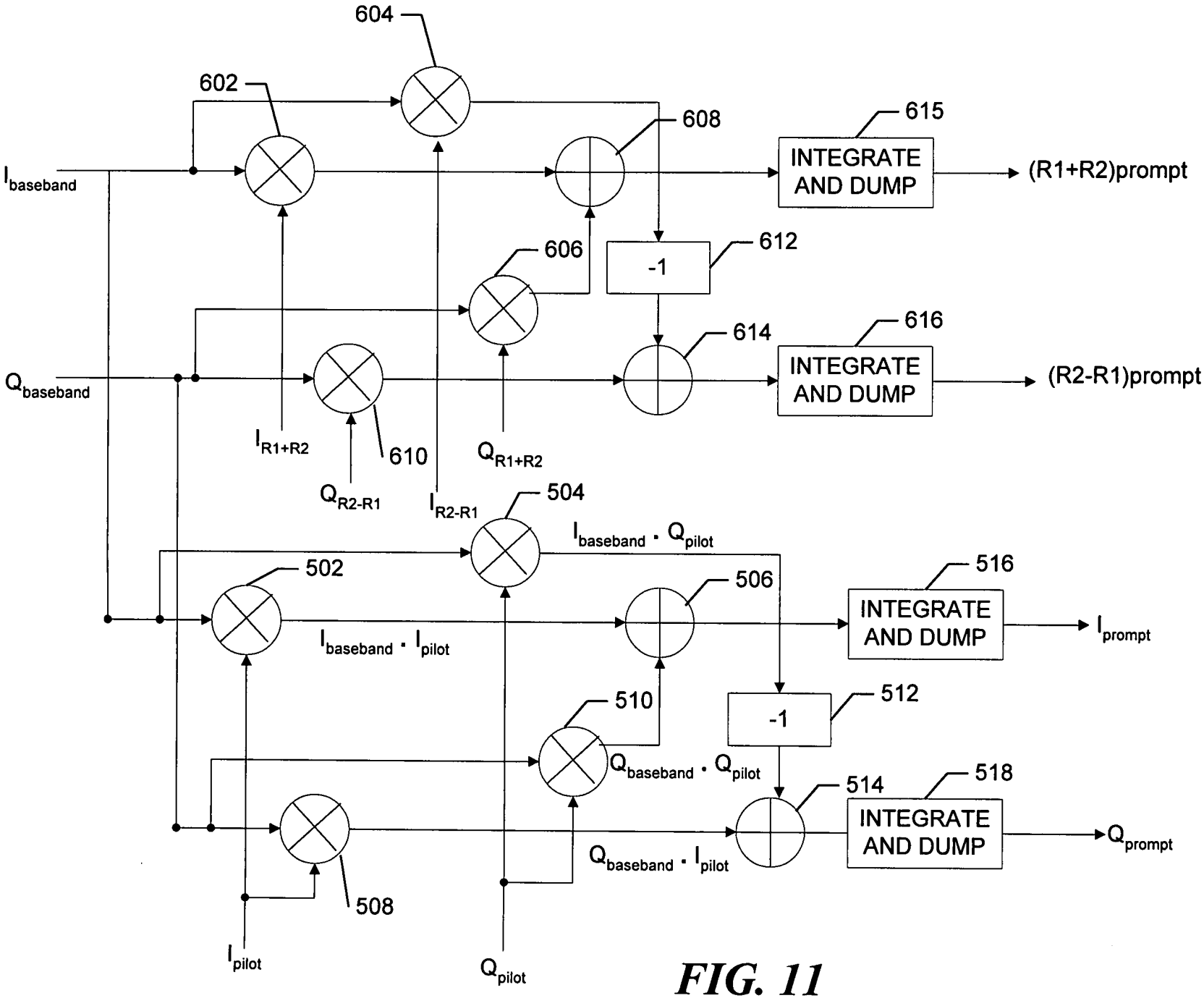
604
602
608
615
INTEGRATE AND DUMP
(R1+R2)prompt
$I_{baseband}$
606
612
-1
614
616
INTEGRATE AND DUMP
(R2-R1)prompt
$Q_{baseband}$
I_{R1+R2}
610
Q_{R1+R2}
Q_{R2-R1}
I_{R2-R1}
504
$I_{baseband} \cdot Q_{pilot}$
502
506
516
INTEGRATE AND DUMP
I_{prompt}
$I_{baseband} \cdot I_{pilot}$
510
512
-1
$Q_{baseband} \cdot Q_{pilot}$
514
518
INTEGRATE AND DUMP
Q_{prompt}
$Q_{baseband} \cdot I_{pilot}$
508
I_{pilot}
Q_{pilot}

FIG. 11